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10/804,230	03/19/2004	Kenneth McQueeney	66396-145	6074

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EXAMINER
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KRAMSKAYA, MARINA

ART UNIT	PAPER NUMBER
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2858

DATE MAILED: 02/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

### Period for Reply

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2006.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1, 4-16 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 5-16 is/are rejected.
- 7) ☒ Claim(s) 4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

1. Claim 4 is objected to because of the following informalities: claim 4 depends from canceled claim 3. For the purpose of this examination, claim 4 will be interpreted as depending on claim 1. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 6, 7, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dittmann et al., US 5,444,376, in view of Willenbecher, Jr., US 4,090,130.

As per Claim 1, Dittmann discloses a capacitive probe (FIG. 1 & 2) for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition coil (11, 12; column 3, lines 36-40), the capacitive probe comprising;

- a base portion 32;
- a fastening device 34 by which the base portion 32 of the capacitive probe may be removably attached to an ignition coil housing of an ignition coil 12 under test;

- a positioning member **35** connected to the base portion **32** (at connection point **36**); and
- a first and second capacitive sensors (**25**, **26**) arranged on the positioning member, each capacitive sensor (**25**, **26**) having an electrical lead (**30**, **35**) connected thereto.

Dittmann does not explicitly disclose the first capacitive sensor and second capacitive sensor comprising metallizations having different areas.

Willenbecher discloses a capacitive ignition probe wherein the first capacitive (**18**) sensor and second capacitive (**30**) sensor comprise metallizations having different areas (column 4, lines 34-54).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a capacitive probe with a first capacitive sensor and a second capacitive sensor comprising metallizations having different areas, as taught by Willenbecher, in the sensor of Dittmann, in order to reduce the probe pickoff plate capacitance to a minimum value (Willenbecher: column 4, lines 51-54).

As per Claims 6 and 15, Dittmann further discloses a capacitive probe for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition coil, further comprising

an arm **36** connecting the positioning member **35** to at least one of the base portion **32** and the fastening device **34**, wherein

the positioning member **35** is adapted to move along at least one axis relative to the base portion **32** (i.e. the lead **35** is movable), and

at least one of the positioning member **35** and arm **36** are adapted to move along or about at least one axis relative to the base **32** portion (i.e. the lead **35** is movable).

As per Claim 7, Dittmann, as modified, discloses a capacitive probe for detection of electric fields present near hybrid or DIS ignition coil as applied to claim 6 above.

Dittmann does not explicitly disclose an arm comprising a curvilinear plate.

Willenbecher discloses a capacitive ignition probe with an arm comprising a curvilinear plate (**34**, see FIG. 4).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a curvilinear plate, as taught by Willenbecher, in the sensor of Dittmann, in order to fit the arm to the ignition.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dittmann et al., US 5,444,376, in view of Willenbecher, Jr., US 4,090,130 as applied to claim 1 above, and further in view of Yerkovich et al., US 5,208,541.

Dittmann, as modified, discloses a capacitive probe for detection of electric fields present near hybrid or DIS ignition coil as applied to claim 1 above.

Dittmann does not disclose the probe where at least one of the first capacitive sensor and second capacitive sensor comprises a metal plate.

Yerkovich discloses the ignition coil testing probe **15** where at least one of the first capacitive sensor and second capacitive sensor comprises a metal plate (**35**; column 3, lines 23-24).

Therefore, it would have been obvious to a person of ordinary skill in the art to use a metal plate capacitive sensor, as taught by Yerkovich, in the probe of Dittmann, in order to have a conductive surface to detect the field.

5. Claims 8 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dittmann et al., US 5,444,376, in view of Willenbecher, Jr., US 4,090,130 as applied to claim 1 above, and further in view of Shaland, US 5,132,625.

As per Claim 8, Dittmann, as modified, disclose a capacitive probe for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition coil as applied to Claim 1 above, wherein a capacitor (**45**) is connected to at least one of the first capacitive sensor and the second capacitive sensor (**25, 26**) to substantially equalize an amplitude (of the signal detected by sensors **25** and **26**) between the first capacitive sensor and the second capacitive sensor (i.e. calibrate: column 4, lines 28-37).

Dittmann does not disclose associating the first capacitive sensor with a positive going output of the ignition coil under test and associating the second capacitive sensor with a negative going output of the ignition coil under test.

Shaland, US 5,132,625 discloses associating the first capacitive sensor with a positive going output of the ignition coil under test and the second capacitive sensor with a negative going output of the ignition coil under test (ABS, lines 5-10).

Therefore, it would have been obvious to a person of ordinary skill in the art to have one sensor associated with the positive going output of the ignition coil and another sensor associated with the negative going output of the ignition coil, as taught by Shaland, in the detection device of Dittmann, in order to account for both the positive and negative voltage signals that are output for accurate detection.

As per Claim 16, Dittmann further discloses a capacitive probe for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition coil according to claim 8, further comprising

an arm **36** connecting the positioning member **35** to at least one of the base portion **32** and the fastening device **34**, wherein

the positioning member **35** is adapted to move along at least one axis relative to the base portion **32** (i.e. the lead **35** is movable),

at least one of the positioning member **35** and arm **36** are adapted to move along or about at least one axis relative to the base portion **32** (i.e. the lead **35** is movable), and

the capacitor **45** connects at least one of the first capacitive sensor **25** and the second capacitive sensor **26** to at least one of the positioning member **35** and the arm **36** (through capacitor **47** and diode **37**).

6. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dittmann et al., US 5,444,376, in view of Maruyama et al., US 5,419,300.

As per Claim 9, Dittmann discloses a diagnostic system for analyzing the operation of an engine (FIG. 1 & 2), the diagnostic system comprising:

a capacitive probe (FIG. 1 & 2) for simultaneously detecting an amplitude of a first and a second electric near field present proximate a hybrid or DIS ignition coil **12** housing, the capacitive probe comprising a fastening device **34** configured to removably attach the capacitive probe to the ignition coil housing and a body **12**, the body bearing a first signal detector and a second signal detector (**25, 26**),

wherein each of the first signal detector and a second signal detector are arranged adjacent a location of a respective one of the first and second electric near fields for detecting an amplitude of the respective electric near field (i.e. near the ignition coil, see FIG. 1); and

wherein each signal detector outputs (via **30, 35**) a signal representative of a respective electric near field.

Dittmann does not explicitly disclose the first signal detector and the second signal detector comprising respective capacitive elements that are of different structural configuration from each other.

Maruyama discloses a capacitive ignition sensor, wherein the first signal detector **13** and the second signal detector **14** comprise respective capacitive elements (i.e.



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detective capacitor **15**) that are of different structural configuration from each other (see FIG. 5).

Therefore, it would have been obvious to a person of ordinary skill in the art to use capacitive element with different structural configurations from each other, as taught by Maruyama, in the sensor of Dittmann, in order to provide for good connection to the ignition system (Maruyama: column 6, lines 9-11,16-23).

As per Claim 10, Dittmann further discloses the diagnostic system further comprising:

a signal processor **32** for receiving the signals output from the capacitive probe and processing the signals (in **32**).

As per Claim 11, Dittmann further discloses the diagnostic system further comprising:

a reporting system (in **32**) for receiving signals processed by the processing system and generating a physical representation of the processed signals (output **33**).

As per Claim 12, Dittmann discloses a method for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition coil (**11**, **12**; column 3, lines 36-40) housing, comprising the steps of:

- providing a capacitive probe (FIG. 1 & 2) comprising a fastening device **34** configured to removably attach the capacitive probe to the ignition coil **12**

housing and a body **32**, the body bearing a first signal detector **25** and a second signal detector **26**;

- attaching the capacitive probe to the ignition coil housing (by means **27**, **28**);
- positioning the first signal detector **25** proximate a position of the ignition coil **11** housing adjacent a location of a first electric near field;
- positioning the second signal detector **26** proximate a position of the ignition coil **12** housing adjacent a location of a second electric near field;
- simultaneously detecting the first electric near field using the first signal detector and detecting the second electric near field using the second signal detector (column 1, lines 44-45), and
- outputting from each of the first signal detector **25** and second signal detector **26** a signal **33** representative of a respective one of the first and second electric near field.

Dittmann does not explicitly disclose the first signal detector and the second signal detector comprising respective capacitive elements that are of different structural configuration from each other.

Maruyama discloses a capacitive ignition sensor, wherein the first signal detector **13** and the second signal detector **14** comprise respective capacitive elements (i.e. detective capacitor **15**) that are of different structural configuration from each other (see FIG. 5).

Therefore, it would have been obvious to a person of ordinary skill in the art to use capacitive element with different structural configurations from each other, as taught

by Maruyama, in the sensor of Dittmann, in order to provide for good connection to the ignition system (Maruyama: column 6, lines 9-11,16-23).

7. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dittmann et al., US 5,444,376, in view of Maruyama et al., US 5,419,300 as applied to claim 12 above, and further in view of Sims, US 5,614,828.

As per Claim 13, Dittmann, as modified, discloses a method for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition coil housing as applied to claim 12 above. Dittmann also discloses processing a signal output by at least one of the first signal detector and second signal detector (in **32** where the output is **33**).

Dittmann does not disclose using at least one of a signal processor and amplifier.

Sims discloses a DIS testing system where the signals are processed using at least one of a signal processor **15** and amplifier **22**.

Therefore, it would have been obvious to a person of ordinary skill in the art to use a signal processor and an amplifier, as taught by Sims, in the testing method of Dittmann, in order to amplify the signal of the ignition coil.

As per Claim 14, Dittmann, as modified, discloses a method for simultaneously detecting a plurality of electric near fields present proximate a hybrid or DIS ignition coil housing as applied to claim 12 above. Dittmann also discloses reporting at least one

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signal output **31** by the first signal detector and second signal detector to a further diagnostic device **48**.

Dittmann does not disclose reporting of the signals to a display device, a printing device, communication device, and an electronic storage device.

Sims discloses reporting of the signals to a display device (i.e. oscilloscope). Sims does not explicitly disclose further connection to a printing device, communication device, and an electronic storage device. However connection of a printing device, communication device, and an electronic storage device is well know in the art.

Therefore, it would have been obvious to a person of ordinary skill in the art to incorporate a printing device, communication device, and an electronic storage device in the further diagnostic device **48** of Dittmann in order to have a record of the capacitively sensed data.

### ***Allowable Subject Matter***

8. Claim 4 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As per Claim 4, Shaland, US 5,132,625 teaches of capacitive sensors wherein one is associated with a positive going output of the ignition coil under test and the other capacitive sensor is associated with the negative going output of the ignition coil under test (ABS, lines 5-10). However, the prior art fails to teach the association of a capacitive sensor with different areas to the different polarities.

9. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

### ***Response to Arguments***

10. Applicant's arguments with respect to claims 1 and 5-16 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kameda et al., US 6,281,682, discloses a capacitive ignition probe with two metal plates.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marina Kramskaya whose telephone number is (571)272-2146. The examiner can normally be reached on M-F 7:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on (571)272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MK

Marina Kramskaya  
Examiner  
Art Unit 2858



DIANE LEE  
SUPERVISORY PATENT EXAMINER